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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/588,645	05/15/2007	Uwe Limbeck	102063.56866US	9792

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EXAMINER	
LI, JUN	

ART UNIT	PAPER NUMBER
1732	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/588,645	LIMBECK, UWE	
	Examiner	Art Unit	
	JUN LI	1732	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 November 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

Applicant's perfect translation of the current application filed on 11/02/2010 has been fully considered thus previous rejections based on EP 1113516B1 reference have been withdrawn. However, a new ground of rejection has been made as follows.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

1. Claim 1-3 and 5-6, 12-15 are rejected under 35 U.S.C. 103(a) as obvious over Rock et al (EP1113516A1) in view of Reiser (US2004/0157094) and Yang (US2003/0203258).

Rock et al teach a method to cold start a solid polymer membrane fuel cell wherein oxygen and hydrogen are supplied to the cell so that the reacted fuel causes the fuel cell to heat up from subfreezing temperature([0005], [0006],[0013], clms, Fig). Rock further teaches a high temperature (about 80℃, or at least 0 ℃) can be reached via heating a fuel cell stack to a temperature of at least about -20℃ at which electrical current can be drawn from the stack. Rock also discloses heating the coolant with a combuster and circulating the coolant through the stack and after the fuel cell stack reaching a preset temperature the heating of the coolant is discontinued ([0013]).

Regarding claim 1-3, 5 and 12-15, Rock is silent about using the power from the fuel cell to operate the heating device as well as the coolant pump.

Reiser teaches using electric power generated by fuel cell to melt frozen coolant water in the accumulator of the fuel cell stack wherein the heater is powered by electricity generated by the fuel cell stack ([0005], [0006], Fig. 1, [0031]-[0035]).

It would have been obvious for one of ordinary skill in the art at the time of invention filed to adopt such electric power generated by fuel cell to power the heater as suggested by Reiser to modify the cold starting method of Rock because by doing so can help reducing the time required to provide coolant water internally for a fuel cell stack which is started up from at least a partially frozen state, and increasing the amount of power which maybe extracted from a fuel cell stack when initially started up from a frozen state without localized overheating the fuel cell stack as suggested by Reiser ([0005]).

Yang teaches the electricity drawn from the fuel cell stack can be used to recharge the battery which supplies electricity to coolant pump (item 210), cooling fan (item 215), blower (item 206), solenoid valve (246) etc during fuel cell start up and the control circuit (item 244, Fig 2) as soon as the fuel cell system (item 200) is properly started ([0028]-[0033], Fig. 2). Yang also discloses air can be supplied to the system via a blower and hydrogen can be selectively supplied under the control of solenoid valve controlled by a control circuit ([0021], [0024]) wherein such blower and solenoid valve, control circuit are all energized by a

starter battery which can then be recharged by the fuel cell electricity once the fuel cell is properly started ([0033]).

It would have been obvious for one of ordinary skill in the art at the time of invention filed to adopt power generated by fuel cell stack to operate the coolant pump, cooling fan etc as shown by Yang to modify the fuel cell startup process of Rock because by doing so can produce a fuel cell stack with large working current which can be used successfully in electric vehicles and small sized electrical generators as suggested by Yang ([0013], [0034]).

As for the fuel cell output power adequate to operate the coolant pump and the heater, Rock in view of Reiser and Yang already teaches a substantially similar fuel cell starting up process including using power from the fuel cell to operate the coolant pump and the heater, thus such fuel cell output power adequate to operate the coolant pump and heater are expected.

Regarding claim 6, Rock in view of Reiser and Yang already discloses fuel cell generated power can be used to recharge the battery which can provide electricity during start up for running the coolant pump, the cooling fan etc, it would have been obvious for one of ordinary skill in the art to use such fuel cell electricity recharged battery to operate the burner because utilizing such rechargeable battery for operating the auxiliary devices , i.e. the burner, can help producing a fuel cell system with large current load as suggested by Yang.

2. Claim 4 is rejected under 35 U.S.C. 103(a) as obvious over Rock et al (EP1113516A1) in view of Reiser (US2004/0157094) and Yang (US2003/0203258) as applied above, and further in view of Edlund (US6495277).

Rock in view of Reiser and Yang is silent about the recited operating capacity.

Edlund teaches using a supplemental battery for the fuel cell processing assembly from an off to a start up mode wherein a control system (item 30) is used to control the amount of power drawn from the fuel cell stack (item 14) to prevent damage to the fuel cell stack (Fig 1, col 7 ln 57-67, col 8 ln 1-6).

It would have been obvious to one ordinary skill in the art to control the fuel cell capacity amount as shown by Edlund to practice fuel cell system of Rock in view of Reiser and Yang because controlling the fuel cell capacity at a proper amount will help prevent fuel cell damage as suggested by Edlund. Furthermore, one of ordinary skill in the art would have been obvious to operating such fuel cell at a probable capacity via routine optimization (See § MPEP 2144.05 [R-5] II).

3. Claim 7 and 9 are rejected under 35 U.S.C. 103(a) as obvious over Rock et al (EP1113516A1) in view of Reiser (US2004/0157094) and Yang (US2003/0203258) as applied above, and further in view of Amrhein (US2003/0124399).

Rock in view of Reiser and Yang is silent about the burner is operated by hydrogen and the burner is a gas burner.

Amrhein teaches using residual hydrogen from fuel cell unit to operate the burner with improved total energy efficiency of the fuel cell apparatus ([0023], [0041]).

It would have been obvious to one ordinary skill in the art to adopt the hydrogen to operate the burner as taught by Amrhein to practice the burner of Rock in view of Reiser and Yang because using hydrogen operating the burner can help utilize the residual hydrogen fuel from fuel cell thus improve the energy efficiency as suggested by Amrhein. It is to be noted that a hydrogen burner is already a gas burner and one of ordinary skill in the art would have been obvious to choose an efficient gas burner such as a high-performance gas burner as recited in the instant claims to improve the energy utilization efficiency.

4. Claim 8 and 10-11 are rejected under 35 U.S.C. 103(a) as obvious over Rock et al (EP1113516A1) in view of Reiser (US2004/0157094) and Yang (US2003/0203258) as applied above, and further in view of Bloomfield(US3976507).

Rock already teaches an air compressor (Fig, [0015]) wherein supplying oxygen to the fuel cell.

Regarding claim 8 and 10-11, Rock in view of Reiser and Yang is silent about using same compressor to supply air for both burner and fuel cell and the adjusting the ratio of the air.

Bloomfield teaches using a compressor (item 40) supplying air to both fuel cell stack (item 12) and a burner (item 20) via an air control box (item 48), a certain volume ratio of air supplied to fuel cell stack and burner respectively (Fig

1, col 3 ln 52-65, col 5 ln 1-5) wherein the air supplied to the burner can help providing energy for driving the compressor while the air supplied to the fuel cell stack can help producing electricity.

It would have been obvious to one of ordinary skill in the art at the time of invention filed to one compressor for supplying air to both fuel cell stack and burner via an air box controller to help producing electricity from the fuel cell stack and to provide enough energy from the burner for driving the compressor as shown by Bloomfield (col 3 ln 52-65, col 5 ln 1-5). Furthermore, one of ordinary skill in the art would have been obvious to adopt a proper air volume ratio between burner and fuel cell stack such as recited in the instant claims via routine optimization (See § MPEP 2144.05 [R-5] II).

Conclusion

No claims are allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JUN LI whose telephone number is (571)270-5858. The examiner can normally be reached on Monday-Friday, 9:00am-5:30 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Curtis Mayes can be reached on 571-272-1234. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/JUN LI/
Examiner, Art Unit 1732
01/27/2011

/Melvin Curtis Mayes/
Supervisory Patent Examiner, Art Unit 1732